

## PUERTO RICAN OLEACININAE

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In 1935 (NAUT. 49: 21-22) a key to the Jamaican subgenera and sections of *Varicella* has briefly outlined their salient characteristics. In the present survey of the Oleacininae of Puerto Rico (West Indies), which, although poor in specific diversity (7 species), exhibit more fundamental divergences than do the numerous Jamaican forms, the anatomy of some of the members of the other groups is figured for comparison.

In plates 1 and 2, each scale for radular teeth indicates a length of 0.01 mm., for the right half of a transverse row (T) 0.1 mm., and for genitalia and pallial complexes 1 mm. Those abbreviated labels, which are not explained in the text, are defined in Bull. Bishop Mus. 166: 337 (1941).

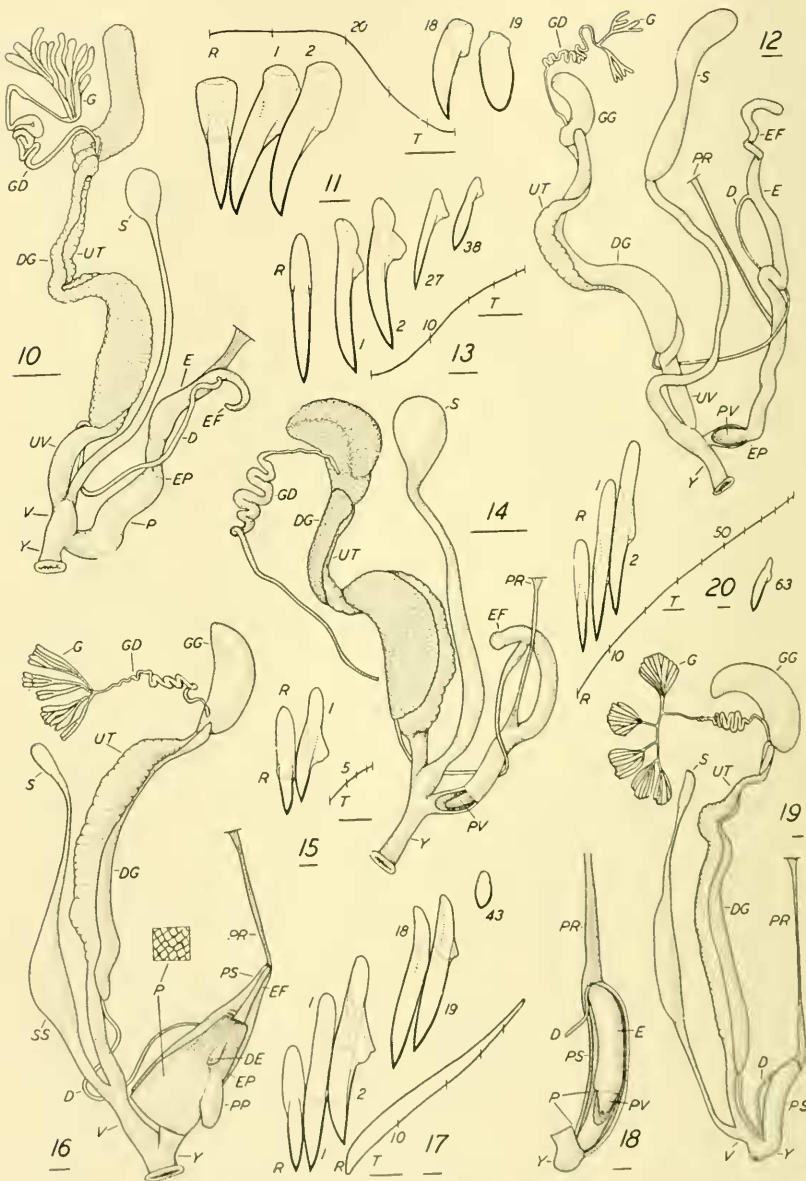
In the following anatomical definition of *Varicella*, comparisons are made with that of *Salasiella* (NAUT. 54: 80) and only salient differences will be noted. The anatomy of one species in each genus or subgenus is similarly compared to that of *V. leuconias striatella*.

Foot elongate, with strong radiating sulci; head with mid-dorsal cord marked off by 2 sulci; tail usually with weak mid-dorsal sulcus broken posteriad; sole abruptly pointed or rounded. Mantle collar deep on palatal side, with small pneumostome (LP, f. 3) and broad glandular zone (MG) with anal lobe. Right mantle-lappet (MR) distant from parietal angle (AP); left ones broad, with anterior (MA) far from posterior (MP), which begins near small basal lobe (LU) and runs up columellar side. Lung wall with minor venation present but indistinct (not shown). Kidney (K), ureter (KD) and groove (KS) along hindgut (HG) similar.

Ovotestis (G, f. 1) with fan-shaped groups of alveoli in larger species. Vagina (V) usually very short; spermatheca (S) with stouter stalk (SS). Spermatophore of *V. mandevillensis* slender, fusiform and smooth; with horny wall. Prostate (DG) long, attached to uterus (UT) full length. Epiphallus (E) without free sheath, continuous (EP) with penis; well developed, with flagellum (EF) and receiving retractor (PR). Penis (P) without diverticulum; often with thin, partially free or intimate sheath (PS; outline only); with large cerebral nerve to base but with another pedal one to epiphallus. Atrium (Y) various.



Figs. 1-3, *Varicella lencozonias striatella*. Fig. 4, *Lacvaricella olabra*. Fig. 5, *V. procer*. Figs. 6-7, *Sigmataxis lacrusculus*. Figs. 8-9, *V. acuticostata horrida*.



Figs. 10-11, *Varicella ricina portlandensis*. Figs. 12-13, *V. portoricensis*.  
Figs. 14-15, *V. sulcalosa*. Figs. 16-17, *Laccaricella interrupta*. Figs. 18-  
20, *L. playa*.

The Cuban group *Glandinella* (tentatively classed as section of *Melaniella*) and the Haitian groups *Varicellidea* and *Varicellopsis* (large shells with spiral sculpture) are omitted from the following key to the anatomically known subgenera of *Varicella*, *Sigmataxis* and *Laevaricella*.

1. Genus *Varicella* Pfr.: radula (not over 1/8 shell length) with over 46 (mainly 60+) fairly transverse rows of small teeth, tricuspid central and at least bicuspid centrifugals; vagina not very short; penis, internally plicate, demarcated by constriction from long naked epiphallus, which receives retractor below vas and has flagellum; spermatheca most sacculate above aorta; shell slender with widely spaced riblets; varices distinct, with growth sculpture between them; columella weakly truncate; type *V. acuticostata*; Fla., Cuba & (?) Haiti: ..... subgenus *Melaniella* Pfr.
2. Like 1, but central with ectocones vestigial or absent; vagina very short; animal usually with dark radial bands; shell shape various but columella usually more truncate; type *V. leucozonias*; Jamaica & Haiti: subgenus *Varicella* s.s.
3. Like 2 but radula (1/6 shell) with all teeth unicuspid and outer spatulate ones in rows curving caudad; penial retractor opposite vas entrance; shell varices not distinctly colored; type *V. curvilabris*; Jamaica:  
subgenus *Varicellina* Pils.
4. Like 3 but radula (1/5 shell) with all teeth aculeate in V-shaped rows; epiphallus opening through verge into thin-walled and usually small penis; penial retractor and shell varices more like 1; type *V. portoricensis* (Pfr.); Puerto Rico & Haiti: ..... *Vagavarix*, new subgenus.
5. Like 4 but flagellum much reduced; radula (1/7 shell) with fewer (30) rows of larger teeth; animal usually pale; columella spirally ascending (not truncate) and varices often vague; type *S. laeviusculus*; Jamaica:  
genus *Sigmataxis* Pils.
6. Like 4 but penis & epiphallus invested by heavy sheath, which apically receives retractor; plicate epiphallic cham-

- ber demarcated from penial only by change to papillate lining and base of large stimulator; spermatheca very sacculate below aorta; shell smoothish between distinct varices, with pupiform apex; type *L. semitarum*; Lesser Antilles to Haiti: ..... genus & subgenus *Laevanicella* Pils.
7. Like 6 but epiphallus receiving vas apically and opening through verge into small penis (without stimulator); radula  $1/4$  shell length; atrial opening distant from tentacles; shell with obtusely conic apex; type *L. glabra* (Pfr.); Puerto Rico: ..... *Borriquena*, new subgenus.

VARICELLA (MELANIELLA) ACUTICOSTATA HORRIDA Pilsbry, pl. 1, figs. 8-9. *Man. Conch.* 19: 54.

The dissected animals were collected by Miguel L. Jaume at Mogote de Fonte, San Andreas, Consolación del Norte, Pinar del Rio, Cuba (ANSP. 163913). *Melaniella* is the least distinct of the 4 subgenera of *Varicella*.

Foot fuscous laterally; mantle collar pale. Lung pale, 2.7 base or kidney (little over base or 1.5 pericardium). Ototestis (omitted from f. 9) with 5 alveoli. Penis internally with 5 pilasters, of which largest expands apically into obcordate papilla (outlined at PP). Radula (f. 8) with 79 broadly V-shaped (T) rows of 51 teeth; almost all centrifugals bicuspid; 1 mm. long. [In *V. gracillima floridana* Pils. from Stock Island, animal pale with dark tentacles; vagina much shorter and stouter, but as long as free oviduct.]

V. (S.S.) LEUCOZONIAS STRIATELLA Pilsbry, pl. 1, figs. 1-3. *Man. Conch.* 19: 95.

The figured animals were collected in the John Crow Mts. (EEJ), Jamaica (ANSP. 168242). Other species studied are, in the section *Costavarix*, *V. mandevillensis*, with 37 radular teeth in each of 61 rows, and *V. adamsiana*, with 55 in 69; in *Varicellula*, *V. blandiana*, with 45 teeth (75 rows); in *Varicellaria*, *V. procera*, with 95 teeth (f. 5) in 80 rows (central with 1-3 very variable cusps); and, in *Euvaricella*, *V. similis*, with 91 teeth, *V. biplicatula dissimilis* with 101 (77 rows), *V. venusta* with 113 (73), *V. nemorensis* with 74 (69), *V. spina* with 29, and *V. levis* with 33 (58).

Foot (alive) blue-black with lighter sulci; long but stout; tentacles reddish orange; labial lobes short triangular. Surface of mantle collar (f. 3) and lappets dark, with light border. Lung



dark with jet blotches. Carrefour (X, f. 1) imbedded. Epiphallus internally with irregularly rhomboid folds; externally demarcated from penis by sphincter. [Flagellum slightly smaller in *V. proccra*, subequal in *V. mandevillensis*, bigger in *V. similaris*, about length of rest of epiphallus in *V. spina* and longest in *V. blandiana*; all with retractor nearer epiphallie base and right eye muscle in atrial angle.] Penis internally with 5 beaded pilasters. Right eye muscle free from genitalia. Radula (f. 2) with 181 teeth in 149 rows (T); all centrifugals bicuspid; 4.5 mm. long.

V. (VARICELLINA) VICINA PORTLANDENSIS H.B.B., pl. 2, figs. 10-11. NAUT. 49: 23 (1935).

The figured animals are from the type lot (ANSP. 162992), collected near Nonesuch (EJ3a), Jamaica. Since ectocones are present on all the centrifugals in the preceding subgenera and on none in this species, the gap between *Varicella* s.s. and *Varicellina* seems the greatest inside the genus.

Foot slender and moderately dark. Mantle collar pale. Lung diffusely pigmented; almost 5 times base or 4 kidney (1.4 base or pericardium). Vagina (f. 10) swollen and thick walled. Radula (f. 11) with 83 rows (T) of 93 unicuspid teeth, which are aculeate and in transverse series out to 18th, but then assume spatulate cusps and curve obliquely caudad; 2.3 mm. long.

V. (VAGAVARIX) PORTORICENSIS (Pfeiffer), pl. 2, figs. 12-13. Man. Conch. 19: 122.

The dissected specimens come from 2 miles south of Cataño (JN1), Puerto Rico (ANSP. 177530). Although conchologically very similar to *Euvaricella*, *Vagavarix* is anatomically the most divergent subgenus of *Varicella*, and has little in common with *Varicellina* except its unicuspid radular teeth.

Foot more elongate, lightly pigmented; tail flat dorsad, with evident median sulcus; tentacles paler. Mantle collar pale, narrower; lappets larger, pigmented. Lung with pale areas; 4 times base or kidney (1.3 base or pericardium). Spermathecal sac (f. 12) constricted by aorta. Epiphallus opening at half length of verge (uncovered at PV). Radula (f. 13) has 124 rows (T) of 89-101 slender aculeate teeth; 1st centrifugal longest; ribbon 3.5 mm. long.

V. (VAGAVARIX) CALDERONI H.B.B. Notulae Naturae 88: (1941).

The type (ANSP. 177551) has been dissected.

Like *V. portoricensis* but: Lung much paler although apex

spotted. Spermathecal sac much shorter and stouter, but also constricted; stalk more swollen in basal half. Flagellum about .6 as long as shorter epiphallus proper, which has a knob-like caecum opposite vas entrance and opens at .3 length of verge, that is as long as penis and attenuate apically. Penis much larger, as long as limbs of epiphallus below or above retractor; weakly plicate inside. Atrium shorter. Radula with 164 broadly V-shaped rows of 95 teeth; 3.1 mm. long.

V. (VAGAVARIX) SPORADICA H.B.B. Notulae Naturae 88: (1941).

The type (ANSP. 177532) has been dissected.

Like *V. sulculosa* but: Foot darker dorsad; mantle lappets pigmented. Lung (and apex) much darker; about 4 times base or 3 kidney. Gonad with 3 divided alveoli (more like *V. portoricensis*). Free oviduct longer; vagina and base or spermathecal stalk more swollen. Flagellum with a vermiform appendix on its caecum; retractor inserting on epiphallus proper  $\frac{1}{3}$  latter's greater length below vas entrance. Penis and verge relatively smaller. Radula with 78 rows of 41 teeth; length 2.5 mm.

V. (VAGAVARIX) SULCULOSA (Shuttleworth), pl. 2, figs. 14-15.

*V. s.* and *V. impressa terebraeformis* (Sh.), Pils., Man. Conch. 19: 119-121.

The figured animals, of the typical form, were collected at the type locality, near Humacao (ES3), Puerto Rico (ANSP. 177531). The smoother form (*terebraeformis*), which occurs in damp places or those with good cover, and weakly pigmented animals, with uniformly whitish shells, were also dissected. *V. sulculosa* is but distantly related to the type of *Vagavarix* and approaches *Sigmataxis* in its radula and flagellum.

Like *V. portoricensis* but: Tail rounded above, with weaker groove. Mantle lappets pale, larger. Lung with sparse spots (more on apex); 5 times base or almost 4 kidney (1.2 base or 1.4 pericardium). Ootestis (omitted from f. 14) has 4 small fans of 3-8 alveoli each. Flagellum caeciform, often much shorter than in f. 14; epiphallus opening near tip of verge. Radula (f. 15) with 46 rows (T) of 35 teeth; 2.1 mm. long.

SIGMATAXIS LAEVIUSCULUS (C. B. Adams), pl. 1, figs. 6-7. *Spiraxis l.* Pils., Man. Conch. 19: 35.

The dissected animals come from near Montego Bay (VCMa), Jamaica (ANSP. 168357). Their radular teeth are twice as long as those of the giant *V. leucozonias*. Although *Sigmataxis* is now